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New Applications for Importance-Performance Analysis (IPA) in Higher Education: Understanding Student Satisfaction

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New Applications for Importance-Performance Analysis (IPA) in Higher Education: Understanding Student Satisfaction

ABSTRACT

Purpose - The constantly evolving higher education sector is creating a need for new business models and tools for evaluating performance. In this paper, an overview of the importance-performance analysis (IPA) model and its applicability as a management tool for assessing student satisfaction in the HE sector is provided. The objective is to apply IPA in a new and novel manner, undertaking analysis at three levels; the individual student, for individual attributes and at a construct or factor level which combines individual attributes that are correlated. A practical application is illustrated, assessing the gap between the importance placed on specific student satisfaction attributes and corresponding levels of student-perceived performance realised.

Design/methodology/approach - The "*service product bundle*" (Douglas *et. al*., 2006) is refined based on focus group evaluation. Survey responses from 823 students studying across four Malaysian private Universities are analysed using Factor Analysis and the IPA model utilised to identify importance-performance gaps and explore the implication of the iso-rating line as well as alternative cut off zones.

Findings - Factor reduction of 33 original measurement items results in eight definable areas of service provision which provides a refined and extended management tool of statistically reliable and valid, constructs.

Research limitations/implications - The research is undertaken in a business school context. Further research could focus on other faculties such as computing and engineering or explore other elements of education-based performance.

Practical implications - The research method and study outcomes can support HE managers to allocate resources more effectively and develop strategies to improve quality and increase student satisfaction.

Originality/value - Distinct from other IPA based-studies, analysis is undertaken at three levels; the individual participant, for individual items and at the factor level.

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Keywords: IPA, Importance, Performance, Service Product Bundle, Student Satisfaction, Service Quality.

Introduction

An increasingly market driven higher education (HE) sector is forcing managers to rethink their business models as they strive to increase productivity and global competitiveness (Spender, 2014; Tian and Martin, 2014). In a particularly turbulent business school environment (Davies, 2016), there is increasing pressure for institutions to meet industry-based standards and deliver increasingly high quality programmes (Vaughan and Woodruffe-Burton, 2011), as well as conducting research that is more relevant to non-academic stakeholders (De Onzoño and Carmona, 2016). Business schools and universities are continually seeking to improve their performance in order to attract and retain the best possible students, recruit exceptional staff and improve their financial position (Mazzarol and Soutar, 2012; Willcoxson *et al*., 2011). Increasing attention is being placed upon rankings in global and national university league tables. Rankings are partially determined by the student experience, satisfaction and employability which drive institutional image, brand equity and reputation (Thomas *et al*., 2014; Mazzarol and Soutar, 2012). Satisfaction is closely linked to future income and recommendations (Chan *et al*., 2003; Fornell, 1992). This paper uses IPA in an attempt to better understand student satisfaction which is an increasingly important metric for measuring performance in the HE sector.

In studies undertaken within the HE sector, scholars have frequently measured performance focusing on student satisfaction (e.g. Mai, 2005; Sapti *et. al.,* 2009). Other researchers have investigated the importance of factors that enhance the student experience, encourage a potential student to study a particular course or attend a specific University (e.g. Wong *et. al.,* 2016; Buultjens and Robinson, 2011; Prugsamatz et. al. 2006). In general, the extant literature has focused on understanding the *importance* that specific attributes such as teaching quality or research outputs play in improving the student experience and increasing satisfaction. Alternatively, other scholars have explored relative *performance* using models such as SERVPERF and SERVQUAL (e.g. Galeeva, 2016; Randheer, 2015). Importance-Performance Analysis (IPA) enables both the *importance* of attributes and a user's satisfaction of the *performance* of specific attributes (Sheng *et al*., 2014) to be analyzed simultaneously in a synergistic manner (Hawes and Rao, 1985; Martilla and James, 1977). Recently there has been resurgence of academic studies that have critically evaluated and improved IPA. There has been a rejuvenation of interest in using IPA across numerous industries including tourism (Azzopardi and Nash, 2013; Ziegler *et al*., 2012), banking (Arbore and Busacca, 2011), healthcare (Miranda *et al*., 2010), hotels (Ho *et al*., 2014), retailing and logistics (Chiu *et al*., 2011), and shipping (Jafari *et al*., 2013). Although IPA is a useful multi-attribute technique for education providers seeking to improve performance in the areas that students value and believe are important, there has been a lack of attention paid to IPA in the HE sector.

In order to address apparent gaps in the HE literature, this study contributes to knowledge by providing an overview of the IPA model and its applicability to the sector. The paper provides a practical application by assessing the gap between the importance placed on attributes of the higher education experience and performance based on the level of satisfaction actually realised by students. The objective of this paper is to apply IPA in a new and novel manner, undertaking analysis at three levels; the individual student, for individual attributes and at a construct or

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factor level which combines individual attributes that are correlated. Analysis is undertaken in the context of private universities in Malaysia, which has been striving to develop into a regional education hub (Menon *et al.,* 2014). Further research focusing on Malaysian students' perceptions of HE provider performance has been highlighted as important by Yusoff *et. al*. (2015).

The remainder of this paper comprises of a literature review that considers service quality in higher education and the IPA model. Next, the methodology section is presented followed by a description and discussion of the findings. Finally, a conclusion is developed, implications are described, limitations identified and areas for further research highlighted.

Service Quality in Higher Education

Quality and excellence represent the aspirations of many organisations including educational institutions, as attainment of both is likely to provide a competitive advantage. It is widely accepted that organisations are operating in extremely challenging environments where it is important to continuously enhance quality to be competitive (Baron *et al*., 2009; Parasuraman *et al*., 1985). Universities are increasingly competing for both local and international students (Pfeffermann, 2016; Paswan and Ganesh, 2009). HE service characteristics include intangibility, perishability, heterogeneity and inseparability. These characteristics make it difficult for increasingly demanding students to make choices between university providers, unless they are aware of the quality of education provision. Service quality is therefore a discerning factor for HE institutions seeking to set themselves apart from their competitors and produce high quality graduates (Chong and Ahmed, 2013; Arif *et al*., 2013). Higher quality is driven by a combination of excellent learning processes as well as student satisfaction relating to the service delivered. Service quality necessity in HE has been discussed from the specific viewpoint of students as consumers (Joseph *et al*., 2005; Russell, 2005; Tan and Kek, 2004; Oldfield and Baron, 2000). New business models mean universities are increasingly taking a more business-like approach while attempting to meet and exceed the needs of students as clients (Gruber *et al*., 2010). Managers are attempting to monitor service quality as they strive to increase student satisfaction and profitability.

Despite criticisms, most researchers focusing on service quality in an HE setting have adopted SERVQUAL and SERVPERF models (Galeeva, 2006; Teeroovengadum *et al*., 2016; Bigne *et al.,* 2003; Oldfield and Baron, 2000). The five dimensions that underpin the SERVQUAL model (tangibles, reliability, responsiveness, assurance and empathy) have been criticised for not drawing from established economic, statistical and psychological theory and for a lack of dimensionality and the universality (e.g. Buttle, 1996). Various other studies have expressed concern that SERVQUAL merely focuses on measuring functional quality which may lead to bias when attempting to understand consumer behavior (e.g. Kang and James, 2004; Badri *et al*., 2005; Hossain, 2014; Ladhari, 2009; Shahin and Samea, 2010). The SERVPERF model which was developed by Cronin and Taylor (1992) in an attempt to address weaknesses in SERVQUAL. SERVPERF has also been criticised for a lack of methodological soundness, its emphasis on psychometric aspects and its composite scales (Parasuraman *et al,*. 1994). As it was constructed with a focus on developed nations it may not be suitable for developing economies (Mostafa, 2006). Because of their broad focus rather than specific emphasis on factors that influence student satisfaction, both models fail to provide practical guidance for business

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managers in the HE sector who are seeking to improve performance in specific areas such as teaching quality or student support.

In response to the conceptual and operational criticisms directed towards both SERVQUAL and SEVPERF models, alternative instruments in measuring service quality in higher education have been developed (e.g. Douglas *et al*., 2006; Owlia and Aspinwall, 1998). In HE, a core service is the lecture, but other supplementary services, both academic and support, are needed to make the educational experience a holistic one (Buultjens and Robinson 2011; Sohail and Shaik, 2004; Thomas and Galambos, 2004). Douglas *et al*. (2006) utilise the concept of the "*service-product bundle*" to develop a 60 item measurement model. The bundle consists of an inseparable bundle of physical or "*facilitating goods*"; sensual or "*explicit*" services, as well as psychological or "*implicit*" services. Facilitating goods represent the tangible offerings provided by educational institutions such as library, sport, recreational, computing, classrooms that are necessary to support academic learning and student life and can influence enrollment decisions (Price et al. 2003). They also influence perceptions of quality and overall student satisfaction (e.g. Sapri et al., 2009 Poh and Samah. 2006; Mai 2005; Banwet and Datta 2003; Hill et al., 2003). Explicit services relate to the knowledge and expertise of staff as well as feedback and assessment. Implicit services include how HE employees treat students when they have a problem. They also capture staff friendliness and approachability while assessing how the environment conveys confidence and professionalism (Douglas *et. al*, 2006). Explicit services including feedback and interaction (Tam, 2002; Geall, 2000) represent crucial determinants of student satisfaction and their associated perceptions of quality education (e.g. Sapri *et al*. 2009; Voss and Gruber (2006). With regards to implicit services, studies have shown that academic staff who are passionate in their profession and are willing to be helpful, motivate students (Chong and Ahmed, 2014; Quintal and Phau, 2014). The service product bundle is suitable for application within the HE sector as it provides a more comprehensive understanding of student needs than those afforded by alternative service models such as SERVQUAL and SERVPERF.

Importance-Performance Analysis

The IPA or importance-performance analysis model (Martilla and James, 1977) is a tool that can be used to support organisational improvement and marketing strategy development, affording versatility through customisation. Versatility underpins the assessment of "*importance*" and "*performance*", thus steering "*priority improvement areas*". It is achieved by modifying the models' structural composition. An example of this is the adoption of specific scale sizes for particular applications (Slack, 1994). The IPA model provides a matrix that can enable decision makers and stakeholder groupings to illustrate the most important service attributes as perceived by consumers. A high level of performance (which in this paper relates to student satisfaction) with these priority characteristics is closely linked with an enhanced likelihood of service recommendation (Sheng *et al*., 2014). As illustrated in Figure 1, an attractive and interesting feature of the IPA model is that the results may be graphically displayed on a two-dimensional grid after examining the mean importance and performance ratings of the service attributes. Presentation of the results on the grid will help managers to interpret the data and to identify areas that need attention. The four quadrants are labelled as Quadrant A (Concentrate here); Quadrant B (Keep up the good work); Quadrant C (Low priority); and Quadrant D (Possible overkill). Due to its usefulness in identifying areas for better allocating resources, the IPA model has been adopted in many sectors. Applications in the education sector have however been

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limited (e.g. Angell *et al*., 2008; Daud *et al*., 2011; Douglas *et al*., 2006; O'Neil and Palmer, 2004; Yildiz, 2013). Therefore, there is a need for more research that highlights that potential usefulness of IPA in an HE context, which may help address the lack of applications in this sector in the future.

[Figure 1 here]

In their study of Australian university students, O'Neil and Palmer (2004) used focus groups to refine the SERVQUAL scale into 22 items they believe are more suitable for measuring service quality in the HE sector. Using factor analysis they identified three underlying dimensions that influenced service quality in HE *("process"*, *"empathy"* and *"tangible"*) at a single university. Next, they developed an IPA model to illustrate how the institute is under-performing with regards to empathy but performing well on process. In a UK study of post graduate students, Angell *et al*. (2008) utilised focus groups to categorise 20 service attributes and four service factors. Subsequently, they used IPA analysis to show how "*academic*" and "*industry links*" were more important than "*cost*" and "*leisure*". Daud *et al*.'s (2011) study of Malaysian managers evaluated managers' perceptions of graduate performance in terms of knowledge, skills, abilities and personality using the IPA model. In a similar way, Yildiz's (2013) study of service quality at 9 Turkish Schools of education and sports analysed in depth interviews of 30 students to identify 38 service items which were classified into four factors ("*behavioural aspects", "academic aspects", "access"* and *"academic support"*) that were subjected to IPA analysis. Hanssen and Mathisen (2016) explored how high school students select Norwegian HE institutions to study as using IPA. Silva and Fernandes (2011) evaluated service quality at a Portuguese University over 8 categories using 42 questions. Douglas *et. al*. (2006) conducted an IPA analysis across the 60 items comprising their service product bundle, ranking the performing areas in descending order of importance. All of these studies conduct IPA analysis for individual items or questions and/or factors but not at the individual student level. The current paper extends previous studies by considering aggregated importance and performance at the individual student level. In addition, the service product bundle is refined into a smaller number of factors, thereby simplifying resultant manager decision making.

In studies of IPA models, there has been on-going discussion regarding the scale size to adopt (Bacon, 2003; Sheng *et al*. 2014; Slack, 1994). The necessity for scale transformation to permit differentiation of importance scores that have a tendency to cluster at the high end of the defined scale and to further acknowledge the range of assessed features that underpin these scores has been acknowledged by Abalo *et al*. (2007). Criticism exists around the validity of the results afforded, with pointers to more sophisticated analytical approaches being adopted (Bacon, 2003). The tandem assessment of importance-performance is credited for being superior to standalone, point assessments of importance independent of consumer perceived outcome. Importance had a level of fluidity in itself for differing levels of performance (Sampson and Showalter, 1999).

Established "*attribute-importance*" assessment is being superseded in a number of more recent studies by more sophisticated evaluation involving the attribute-impact range on overall satisfaction (Mikulić and Prebežac, 2008; Sheng *et al*. 2014; Hanssen and Mathisen, 2016). Similarly, Abalo *et al*. (2007) advocate the application of relative rather absolute measures of importance assessment. This can be achieved practically by using the respective grand means for importance and performance assessment rather than arbitrary benchmarks for attainment.

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Benchmarks make no consideration of the actual levels of importance declared and performance attained. In cases of potential disparity between the two, benchmarks offer relatively little in terms of discriminating areas for priority consideration. In short, if performance is much lower than importance, setting a high cut-off point for each will simply give the message everything should have high priority. For many organisations, this will not be practically feasible. Eskildsen and Kristensen (2006) suggest that any implied supposition of independence between these two assessments across a whole suite of measured attributes is "*flawed*", with assessment of the importance-performance relationship being assessed within an overall framework needing to account for each specific attribute relationship within. The application of regression analysis here resonates with similar applications such as the revised framework for IPA presented by Arbore and Busacca (2011). Further recognition is for example given to the benefits of accounting for non-linear relationships that may underpin performance. Azzopardi and Nash (2013) question the reliance of assessing importance from the solitary position of only direct assessment measures. In doing so, they argue for the inclusion of indirect assessment so as to enhance the validity of the assessment tools employed.

Despite these parallel advances and criticisms, the more straightforward analysis of importance-performance still has merit and has also been deployed in relatively recent studies (Ziegler *et al*., 2012; Sőrensson and von Friedrichs, 2013). Ziegler *et al*. (2012) recognise that even in the traditional and relatively simpler application of IPA, the shortcoming of separate importance and performance assessment is avoided, even if there is a subjective overlay of cut-off points against both measures. In providing this tandem analysis, areas of greatest priority are clearly highlighted. One outcome of this work is the recommendation by Ziegler *et al*. (2012) of the *iso-rating* line as the most sensitive method for highlighting the greatest importance-performance deviation, and in turn, areas for most immediate management attention. This approach of dual assessment is also endorsed by previous researchers (Bacon, 2003; Hawes and Rao, 1985). In addition to iso-rating, Martilla and James (1977) suggest that positioning the vertical and horizontal axes on the grid is a matter of decision-maker judgment. This decision permits determining relative, rather than absolute levels of importance and performance. This could be objective, absolute values or the overall respective mean scores for importance and performance.

Study Design and Data Collection

Instrument Development, Piloting and Testing

The assessment of importance and performance in this study draws upon the original work of Douglas et al. (2006) who developed a "service-product bundle model". This afforded paired assessment of importance and performance. It also endorses various recommendations on scale length that suggest using 5-point Likert Scales (very negative through neutral to very positive in both cases) (Sheng et al., 2014; Bacon, 2003; Slack, 1994). The Malaysian government has been continuously striving to develop the country to become a regional education hub, therefore increasing attention is being placed on understanding the factors that influence performance in the sector (Menon *et al.,* 2014). As such Malaysia provides an ideal context for this research.

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Initial piloting with five focus groups in a Malaysian private University setting involved instrument assessment of the Douglas et al. (2006) 60 original questions, particularly around their local relevance. This assessment involved both Malaysian and international students. Items such as "lecture room level of cleanliness" and "tutorial room lighting" were not perceived as important in the original Douglas et al. (2006) study. Likewise, the Malaysian focus groups also suggested a local lack of relevance to their inclusion in assessing performance. Consequently, they were removed from the questionnaire. This resulted in 31 paired-items pertaining to both performance and importance being retained. Across-the-board modification to item terminology made the revised instrument context and setting specific in its entirety, with necessary tweaking for certain items from the original UK-based work. Two items relating to enrollment and accommodation were added as a consequence of focus groups' input, giving a total of 33 items. Before undertaking the substantive study, the updated survey instrument was tested on 20 students, who in turn provided feedback, alongside their survey response. This provided assessment of face and context validity. From a practical perspective, it also gave feedback on clarity, wording, instructions and overall accessibility.

Participant Selection

The substantive study comprised of business school students studying at four private Malaysian HE Institutes. Malaysian was selected as a context for this study because the government and universities have also been striving to develop the country into a regional education hub (Menon *et al.,* 2014). Therefore, understanding factors influencing Malaysian students' recognition of HE provider performance and their importance to them as clients is particularly important (Yusoff *et. al*. 2015). Within each institution, a stratified random sampling approach was undertaken. This involved stratification across study year with classroom-administered surveys taking place within the associated business schools. Random class selection, was assisted by members of the chosen faculties, an approach resonating with previous studies (O'Neil and Palmer, 2004; Prugsamatz *et al*. 2006). Across the four participating HEIs, 1200 questionnaires were distributed face to face in the class room over a period of 4 months, resulting in 823 completed returns, representing participation of 69%. This arguably would support a claim that the subsequent findings are highly generalisable.

Methods of Analysis

It was essential to identify the underlying structure of the data collected in this study. This reflects the application of a study instrument amended in terms of wording and item content deployed in a new academic setting. To determine this, an Exploratory Factor Analysis (EFA) was undertaken. Central to the application of EFA is that no *a priori hypotheses* are assumed. Consequently, the approach permits theory development rather than the assessment of an assumed or accepted model.

This EFA was undertaken separately for the items pertaining to importance and performance. The methods of factor analysis undertaken in both cases involved Principal Axis Factoring. Factor extraction was achieved using the accepted and standard Kaiser criterion in the first

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instance. This was then subject to iteration given the rotated solutions generated. Varimax rotation provided the rotated solutions for both importance and performance factors comprising statistically independent factors in both cases (Field, 2000). For both the importance and performance data, an assessment of the internal reliability of the identified factors was made using the Cronbach's alpha coefficients for each factor individually (Bryman and Cramer, 1994).

In both applications of the EFA, the final rotated factors were assessed for their key loaded variables. The factor analysis was re-run on an individual factor basis to provide individual factors saved as a regression model. In turn, each of these was re-scaled using a weighted mean and pooled standard deviation determined from each of the key loaded items. These re-scaled factors were used in the analysis to be presented.

The overall measure for both importance and performance is provided separately by:
Function (importance or performance) = $[x_1 + x_2 + \ldots\ldots + x_n]/n$

The overall importance-performance relationship is assessed by means of correlation analysis. This was accompanied by assessment of the correlation between constituent factor components and pairwise evaluation for differences using the relevant t-test. Differences between importance and performance by participant demographics were assessed by t-test or one-way ANOVA, as appropriate. For each of these tests, significance is presented at the standard levels for business research, i.e. 5%, 1% and 0.1% levels of significance.

The importance-performance relationship will be presented graphically across the participants response set and assessed by means of simple quadrant analysis for the factors. By doing so, the potential extent of student dissatisfaction and any gap between performance and pre-defined expectations will be identified. This analysis has been undertaken at three levels; the individual participant, for individual measurement items and at a factor level. Some of the calls for a more sophisticated assessment of importance-performance (Azzopardi and Nash, 2013; Arbore and Bussaci, 2011; Eskildsen and Kristensen, 2006) have not been implemented here, although this is off-set in terms of potential depth in the analysis given the differing dimensions of scrutiny to be presented.

Study Findings

Participant Overview

There were 823 participants in the study providing a full data set for each of the 33 measures covering both importance and performance. The sample of participants demonstrated the following characteristics.

- For gender, 50.1% were female, 49.9% were male.
- In terms of year of study, the respective proportions in years 1, 2 and 3 were 30.9%, 36.0% and 33.2%.
- They covered four institutions; the individual proportions being 29.5%, 23.6%, 24.9% and 22.0%.
- With regard to origin, 69.7% were Malaysian, the remaining 30.3% being "*International*".

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- In terms of academic subjects, 18.2% were from the Marketing discipline, 25.9% from Business Administration, 18.1% from Accounting, 15.1% from Financial Planning, 14.8% from International Business, with 7.9% from "*Other*" disciplines.
- The students had achieved academic grades A to D [1] inclusive in the following proportions; 19.3%, 41.9%, 30.6% and 8.1%.

Performance Items and Scale Development

The 33 items assessing performance exhibited a high level of potential for being factorised, with a Kaiser-Meyer-Olkin statistic of value 0.953, and a highly significant result pertaining to Bartlett's test of sphericity (X^2 = 16270.207, df = 528, p = 0.000). The EFA undertaken suggested no serious issues regarding low levels of communality. However, on the first iteration of the analysis, the loadings on the five factors extracted made interpretation somewhat difficult (as prescribed by the Kaiser criterion). Therefore, the factor analysis was re-run to impose the extraction of eight factors consistent with the literature assessed and the number of potential factors as identified by the original scale set.

The second iteration of the factor analysis resulted in a solution involving the identification of eight statistically independent factors, whose rotated solution provided 58.79% of explained variance. A post-hoc assessment of the eight factors using Cronbach's alpha coefficients resulted in a range of values from 0.743 to 0.879 inclusive. Six out of eight alpha coefficients had values in excess of 0.8, thus suggesting high levels of internal reliability (Bryman and Cramer, 1994). Table 1 provides the details.

[Table 1 here]

For the factors identified in the explanation of performance, three relate to the explicit learning and teaching service (factors one, seven and eight), three to the implicit service provided (factors four, five and six) with factors two and three respectively representing facilitating goods. The most prominent factor extracted, *explicit service – learning, teaching, assessment and feedback*, followed by the factor pertaining to *facilitating goods* exhibit consistency of prominence with that realised for importance.

In terms of typical levels of performance, the Malaysian HEIs generate no particular standout challenges. All eight factors extracted have a mean attainment in excess of 3.0, as indicated in Table 3. The relative strengths of the sector provision in terms of performance are *facilitating goods – classes, materials and texts* and *implicit service – academic support*. One the factors exhibits a mean score in excess of 3.5, i.e. *facilitating goods – classes, materials and texts*, suggesting potential room for improvement in sector performance across the provision in its entirety. Such an outcome provides an additional challenge given the lack of focused priority that accompanies such a similarity in outcome.

Importance Items and Scale Development

[1] Grade A (Exceptional > 80%) Grade B (Good 65-80%) Grade C (Satisfactory 55-65%) Grade D (Poor 40-55%)

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Like the suite of scales assessing performance, the 33 items evaluating students' level of importance, were highly factorisable, as evidenced by the Kaiser-Meyer-Olkin statistic of 0.953, and a highly significant result for Bartlett's test of sphericity (X^2 = 17153.220, df = 528, p = 0.000). The analysis also pointed to an absence of severe problems around low levels of communality. The first iteration of the analysis resulted in loadings on the five factors extracted based on the Kaiser criterion. Again, focusing on only five factors made interpretation difficult to undertake. As for the performance data, the factor analysis was re-run to consider various alternatives, finally imposing the extraction of eight factors.

The next iteration of the factor analysis yielded a solution comprising eight statistically independent factors, the rotated solution providing 63.03% of explained variance (see Table 2). Post-hoc assessment of the eight presented factors by means of Cronbach's alpha coefficients gave a range of values from 0.778 to 0.904 inclusive. For these factors representing importance, seven out of eight alpha coefficients have a value exceeding 0.8. This pointed to internal reliability at a high and acceptable level.

[Table 2 here]

Similar to the analysis of the factors identified for performance and presented above, the most dominant factor related to importance is the explicit service relating to learning, teaching, assessment and feedback. This represents the first of three factors covering explicit service, the others being factor five, which relates to learning delivery and its organisation, and factor seven which comprises feedback and the role of support (non-academic) staff. There are also three factors identified that cover the implicit service afforded to the students. The first, factor three covers implicit support at the university level, with factor four comprising academic support and factor eight defined in terms of staff availability and competence. The other two factors that are identified from this analysis are factor two, which is defined as facilitating goods – classes, materials and texts, alongside factor six which assesses support facilities.

Inspection of the factors presented in Tables 1 and 2 indicate a high level of commonality in the loading of the original variables to the extracted factors for both performance and importance. This affords both commonality of factor definitions to be provided and correspondingly, a high level of direct one-to-one comparison between the respective measures of performance and importance. In allowing this, it offers an opportunity to highlight specific areas for priority consideration in either maintaining or enhancing student recognition of provider attainment.

This direct importance-performance assessment at a "*macro*" factor rather than "*micro*" item level has the potential through the IPA analysis to permit the pinpointing of areas of priority to enhance student satisfaction by improving associated perception of performance. A large number of Key Performance Indicators (KPIs), delivered by a suite of 33 individual items or even greater numbers in previous studies, means it can be difficult to address attributes in isolation.

In assessing the typical levels of importance placed by the students on the various factors that describe their day-to-day experiences in HE, their institutional managers face a key priority-related challenge. All eight factors identified exhibit a mean score in excess of 4.0 and are

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therefore deemed important. The standout area of greatest importance in a relative sense is factor two – *facilitating goods – class materials and texts* with a mean score of 4.41, as presented in Table 3.

[Table 3 here]

The means presented for each of the 8 factors representing importance are clearly higher than those exhibited for the eight equivalent factors that explain performance. Pairwise assessment of the equivalent importance-performance attributes (see Tables 1 and 2 for factor definitions and cross-referencing of factors for equivalence, Table 3 for summary statistics) all exhibit statistically significant differences at the 0.1% level (see Table 4). As indicated above, the mean scores presented here in absolute terms make prioritisation difficult. This is made even more challenging when considered alongside the pairwise differences with performance. The simple message is that performance has to improve across-the-board.

[Table 4 here]

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The link between Importance and Performance

The overall association between importance and performance is positive, but only weak to moderate in strength, albeit statistically significant at the 0.1% level, accounting for the number of participants in the study ($r = 0.211$, $p = 0.000$). This relationship is presented graphically in Figure 2. In addition to this overall assessment of association, there are a number of significant associations between the identified factors pertaining separately to performance and importance, although none of these associations stand out in terms of absolute strength. For the eight factors representing performance (see Table 1), there is a clear one-to-one mapping between these and a corresponding factor representing importance and presented in Table 2. If these eight pairs of equivalent performance-importance factors are assessed on a pairwise basis, significant associations are recognised, particularly involving the two pairs of factors that capture student assessment.

[Figure 2 here]

Further assessment of the importance-performance relationship by means of a simple quadrant analysis provides an interesting breakdown of participants. Based on a mean score of 3.0 or higher representing the cut-off between low and high levels of both importance and performance, the data are divided into four parts, as shown by Figure 1.

In terms of this quadrant-based distinction between importance and performance levels, four levels on the quadrant have been defined by Martilla and James (1977) and applied more recently by Douglas *et al*. (2006, p260). These are low performance – low importance as "*low priority*", low performance – high importance as "*concentrate here*", high performance - high importance, as "*maintain quality*" or "*keep up the good work*" and high performance – low importance as "*possible overkill*". The first group of participants, the "*low priority*" clients, represents 4.3% of the cohorts. Further to this group, students exhibiting recognising low performance but placing high importance on their student experience and being labelled as "*concentrate here*" represent 29.4% of the client base. About one-in-three of these students, (8.9% of the total assessed), exhibit a mean performance score of below 2.5 and mean importance score of above 3.5, thus representing the group with greatest disparity in expectations. The relative size of this group and number of students in the low-performance-high importance sub-cohort in general represents immediate sectoral concern.

Equivalent areas of performance and importance exist across the suite of assessed items given the respective extraction and definition of the factors presented in Tables 1 and 2. The subsequent assessment by means of pairwise analysis, suggests that any discrepancy between performance and importance is across-the-board. Therefore, no immediate standout areas emerge for priority consideration or for "*quick-wins*". However, the biggest differences with mean score differences in excess of 1.0 on the five-point continuum scale relate to performance factor three versus importance factor five – assessing *support facilities* and performance factor eight versus importance factor seven – assessing *explicit service – feedback and support staff*. More encouragingly, students reporting high performance, placing high importance on their experience and being labelled as "*maintain quality*" represent the modal group of learners here, comprising 65.5% of the assessed participants. Finally, perhaps the easiest sub-group to consider are those

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who are highly satisfied, but have low expectations given the importance they have attached and are defined as "*possible overkill*" represents 0.9% of the assessed students.

Looking at an item-by-item assessment, all apart from two of the 33 items measures are located in the "*maintain quality*" quadrant, with the two exceptions, "*The registration procedures*" and "*The accommodation facilities/services overall*". These are found in the quadrant labelled "*concentrate here*", thus providing the Malaysian HE institutes with areas for immediate and focused priority. At an aggregated factor level, both of these items can be found in the factor "*Support Facilities*", thus providing an immediate consideration for the sector in terms of one dedicated area of its service provision. In assessing by factor, all eight areas are in the quadrant "*maintain quality*", as shown in Figure 3, despite the recognisable differences at individual participant and item level discussed above. Application of the iso-rating diagonal line would fail to differentiate between the eight identified areas in terms of priority in this application. Each point on the IPA quadrant lies some distance from this line in a single cluster of points providing little priority differentiation. In other applications, the importance-performance outcomes may be different, therefore giving some value to this simpler form of assessment.

[Figure 3 here]

If the cut-off between low and high for both assessment of performance and importance is moved to a score of 3.5 for each, the proportion of individual respondents falling into each of the four quadrants changes radically. These become 12.4% in "*low priority*", 49.5% in "*concentrate here*", 36.6% in "*maintain quality*" and 1.6% in "*possible overkill*". The shift in priority at an item level of measurement also changes considerably, with all items being defined as "*concentrate here*" apart from "*The lectures overall*", "*The PowerPoint slides/presentations*", "*Supplementary lecture materials/handouts*" and "*Supplementary lecture materials/handouts*", as well as "*The friendliness of teaching staff*" and "*The approachability of teaching staff*" which are labelled as "*maintain quality*". The move from moderate levels of both performance and importance to a higher level of attainment (as indicated by a change in score from 3.0 to 3.5 on the five-point scale) results in a much broader base of focus for improvement for the universities which participated in this research.

Factor level consideration suggests only one area, "*Facilitating Goods – classes, materials and texts*" which cover the first four items listed above is at a point of "*maintain quality*". This is shown by Figure 4. The remaining seven defined factors shown in Tables 1 and 2 represent areas of organisational and sectoral priority and are thus labelled as "*concentrate here*". This significant broad-based gap is perhaps unsurprising given the differences in mean factor scores. Here, each dimension of importance having a mean in excess of 4.0, whilst all measures of performance have a mean exceeding 3.0, but only one achieving at least 3.5.

[Figure 4 here]

If the grand or overall means for the performance and importance measures were respectively used as the cut-off values in defining the four quadrants, three areas are signposted to "*maintain quality*", i.e. Facilitating goods – classes, materials and texts, implicit service-academic support

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and learning delivery and organisation. These cut-offs are 3.32 and 4.24 for performance and importance respectively. Four areas are recommended to have lower priority, whilst a final factor, Implicit service - University, was viewed to been subject to possible overkill. This is shown below by Figure 5. The advantage of using the actual grand means for performance and importance rather than arbitrary cut-off points such as 3.0 and 3.5 is amplified in examples such as the one provided here. Where some disparity exists in the overall means between importance and performance, the relative cut-off criteria helps focus in one a much smaller range of areas for quality maintenance and priority. This relative, rather than objective or arbitrary measure of importance-performance has greater value in providing priority and focus to a set of survey outcomes where there is across-the-board disparity between the two sets of attributes.

[Figure 5 here]

The impact of demographics on importance attached to the eight extracted factors was limited to differences by gender. Across the suite of factors, more importance was given on average by the female research participants compared with the male students. Likewise, no differences were exhibited in importance given by year of study and limited amounts by students' grade attainment or institution. In a similar way, there are few significant differences in importance levels attached by students according to domicile, although in each case, the mean score was higher for "*home*" Malaysian students compared with their international counterparts. Overall, with the lack of clear-cut significant differences being identified it is reasonable to indicate that pre-determined expectations of the HE experience have only limited steer according to the demographic background of the individual student. There were no differences based on the origin of students, year of study, grades, or academic subject.

There are significant differences emerging in the "*gap*" (based on the difference in scores for the related pairs of factors, as shown in Table 3) between importance and performance, according to these demographic descriptors. Apart from factor eight – "*Explicit service – support staff*", there are significant differences in the importance-performance "*gap*" by gender. Each of these differences is at the 0.1% level of significance. The gap between the two is always greater for the female respondents. Apart from factor one – "*Explicit Service – learning, teaching assessment and feedback*", the "*gap*" displayed across-the-board significant differences at this level by domicile. The greater differences between importance and performance were found in each case for the domestic Malaysian students compared with their International colleagues. In contrast, limited "*gap*" differences were exhibited by year of study or student performance measured by grade. Therefore, a disparity between importance and performance was not emerging as a consequence of level of student familiarity or academic outcome. There are comprehensive differences between participating institutions across the piece. Two of the four participating institutions are typically displaying a smaller "*gap*" than their counterparts, suggesting the level of work to be in done in these two providers is relatively less compared with the other two organisations.

Conclusion and Implications

An increasingly competitive and market driven environment means managers and institutions in the HE sector are increasingly seeking new business models to improve organisational and

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strategic performance. Student satisfaction is one element of performance. In this study, we apply an IPA model to assess the extent to which students are satisfied with their experiences and the extent of any gap in their expectations. Service priority areas have been categorised for consideration as a consequence of this assessment. This prioritisation has the potential to result in a more effective and efficient allocation of resources, and hence, recognition of priority areas for improvement.

This study has provided a comprehensive 33-item instrument for assessing importance and performance based on the established "*service-product bundle*" (Douglas *et al*., 2006) with further refinement for particular local needs. A subsequent factor analyses has established the various items deployed fit into eight specified areas covering separately but collectively the different aspects of the overall student experience.

Additionally, the quadrant analysis (Martilla and James, 1977) has provided an understandable and accessible, but powerful tool for importance-performance-assessment, subsequently highlighting areas of priority for university decision makers. The assessment of the survey data has provided a useful insight at individual student, item and scale level. The separate factor analysis of the importance and performance items has yielded a respective suite of scales that are directly equivalent to each other, thereby permitting this direct one-to-one importance-performance comparison.

The application of the *iso-rating* line as an appropriate method for identifying deviation between importance and performance has strong endorsement (Ziegler *et al*., 2012; Bacon, 2003; Hawes and Rao, 1985). However, the comprehensive gap between the two broad dimensions is so clear here, that it offers little in terms of helping to set priorities. Instead, an arbitrary cut-off score of 3.5 for each dimension (therefore representing an average of OK to good attainment) in helping to define the four quadrants in the model proved more valuable in priority setting. Equally, the method of using the respective grand means for importance and performance has some merit given the disparity between importance and performance attainment. Where such disparity exists, the latter is particularly useful in providing a narrow focus instead of relaying the message that everything needs to improve and this application is equally appropriate in sectors beyond Universities and higher education.

A clear contribution of this research is the quadrant analysis involving the factor reduction of the measurement items into eight definable areas of the service provision. This was useful in showing a range of broader areas where further work was required. These include the teaching experience and subject expertise (Sapri *et al*., 2009; Douglas *et al*., 2006; Price *et al*., 2003), tangible and physical inputs such as the lecture facilities and class materials (Banwet and Datta, 2003; Hill *et al*., 2003) and academic empathy and support (Voss and Gruber, 2006; Tam, 2002; Geall, 2000). Whilst a gap still exists between importance and performance with regards to student satisfaction, the relative closeness of this suggests that the organisations should refrain from being excessively demonstrative about service and service culture demonstrated through the factors characterised as "*implicit service*". Greater reference to the more tangible aspects of the service offering should be prioritised.

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Limitations and areas for further research

The study has considered only students from the business and management discipline, therefore, moving forward; further refinement to the measurement instrument may have to take place to account for facilities, learning environments and experiences in disciplines that are significantly less classroom based. This would be particularly the case for disciplines with a recognisable practical or laboratory based input, covering subject areas like computing, engineering, health and the sciences. Further research which incorporates more traditional metrics such as the ranking the employability of graduates into an IPA analysis would also be useful. In this paper factors were weighted equally. Additional research where the factors established could be weighted in both cases in terms of their relative importance, perhaps by using the eigenvalues exhibited during the respective EFA process would also be useful.

As indicated above, the measurement tool deployed here used the "*service-product bundle*" (Douglas *et al*., 2006) as the basis for its content, refining it further by the inclusion of additional items recognised as being potentially relevant for the Malaysian deployment of business and management programmes. This refined and extended management tool comprises statistically valid and reliable constructs. These have the potential to be deployed in similar studies including alternative national settings. In these alternative locations, delivery of similar business and management programmes are likely to draw on comparable direct and indirect resources. A potential weakness of this study is that it focused on students at 4 private Universities in Malaysia which makes it difficult to generalise the findings to all private sector Universities or to public Universities. Further research focusing on a larger number of Universities including public Universities would therefore be useful.

Likewise, for the setting considered in this study, a profile of importance and performance with regards to satisfaction has been provided. Areas of priority for closing these gaps by establishing an agenda for improvement has been established. The institutions in this setting have opportunity to take on board the findings and recommendations made here. It may be useful in a longitudinal study to revisit this particular arena and assess the extent to which the importance-performance gap has been narrowed. This assessment may be at individual item or scale level and with respect to those areas of the higher education experience that were highlighted for priority consideration.

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Table 1 - Factor Analysis and Definition of the Performance Measures

Factor	Rotation - % of variance	Factor Definition and loaded items (rotated solution)	Loadings - Rotated Solution	Comunalities - Extraction	Reliability Coefficient	Equivalent Importance Scale
		Explicit Service - learning, teaching, assessment and feedback				
1	11.855	The appropriateness of the style of assessment-individual and/ or groupwork	0.704	0.644	0.877	1
		The appropriateness of the method of assessment-coursework and/ or examination	0.687	0.606		
		The appropriateness of the quantity of assessment	0.657	0.610		
		The course workload	0.633	0.523		
		The promptness of feedback on your performance	0.479	0.505		
		The level/ difficulty of subject content	0.476	0.413		
		The usefulness of feedback on your performance	0.468	0.520		
		Facilitating Goods - classes, materials and texts				
2	9.651	Supplementary tutorial materials/ handouts	0.788	0.756	0.879	2
		Supplementary lecture materials/ handouts	0.751	0.707		
		The tutorials overall	0.583	0.572		
		The lectures overall	0.542	0.606		
		The powerpoint/ slide presentations-where applicable	0.533	0.527		
		Support Facilities				
3	7.489	The accommodation facilities/ services overall	0.658	0.521	0.758	5
		The registration procedures	0.597	0.466		
		The IT facilities overall	0.554	0.399		
		The learning resources centre overall	0.534	0.435		
		Implicit Service - Academic Support				
4	7.250	The approachability of teaching staff	0.745	0.791	0.875	3
		The friendliness of teaching staff	0.687	0.740		
		The concern shown when you have a problem	0.536	0.600		
		The respect for your feelings, concerns and opinions	0.436	0.580		
		Implicit Service - University				
5	7.185	The sense of competence, confidence and professionalism conveyed by the ambience in the tutorials	0.729	0.771	0.861	4
		The sense of competence, confidence and professionalism conveyed by the ambience in the lectures	0.656	0.746		
		The feelings that your best interests are being served	0.497	0.575		
		The feelings that rewards-marks/ grades gained are consistent with the efforts you put into assessment	0.414	0.515		
		The university environment's ability to make you feel comfortable	0.386	0.459		
		Implicit Service - Advice and Competence				
6	5.416	The availability of staff	0.747	0.798	0.867	8
		The competence of staff	0.641	0.726		
		Explicit Service - Learning Delivery and Organisation				
7	5.361	The teaching ability of staff	0.622	0.694	0.821	6
		The consistency of teaching quality irrespective of the lecturer	0.514	0.567		
		The subject expertise of the staff	0.383	0.462		
		The responsiveness of teaching staff to requests	0.346	0.433		
		Explicit Service - Support Staff				
8	4.581	The helpfulness of administrative staff	0.611	0.577	0.743	7
		The helpfulness of technical staff	0.586	0.525		

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Table 2 - Factor Analysis and Definition of the Importance Measures

Factor	Rotation - % of variance	Factor Definition and loaded items (rotated solution)	Loadings - Rotated Solution	Comunalities - Extraction	Reliability Coefficient	Equivalent Performance Scale
		Explicit Service - learning, teaching, assessment and feedback				
1	13.308	The appropriateness of the style of assessment-individual and/ or groupwork	0.658	0.625	0.904	1
		The appropriateness of the method of assessment-coursework and/ or examination	0.657	0.627		
		The appropriateness of the quantity of assessment	0.641	0.573		
		The course workload	0.636	0.554		
		The promptness of feedback on your performance	0.580	0.593		
		The level/ difficulty of subject content	0.574	0.519		
		The usefulness of feedback on your performance	0.549	0.594		
		The responsiveness of teaching staff to requests	0.392	0.497		
		Facilitating Goods - classes, materials and texts				
2	11.122	Supplementary lecture materials/ handouts	0.773	0.731	0.894	2
		Supplementary tutorial materials/ handouts	0.765	0.744		
		The powerpoint/ slide presentations-where applicable	0.650	0.566		
		The tutorials overall	0.648	0.617		
		The lectures overall	0.612	0.640		
		Implicit Service - Academic Support				
3	10.819	The friendliness of teaching staff	0.700	0.698	0.885	4
		The approachability of teaching staff	0.671	0.717		
		The concern shown when you have a problem	0.649	0.631		
		The respect for your feelings, concerns and opinions	0.587	0.617		
		The feelings that rewards-marks/ grades gained are consistent with the efforts you put into assessment	0.406	0.543		
		Implicit Service – University				
4	7.498	The sense of competence, confidence and professionalism conveyed by the ambience in the tutorials	0.719	0.789	0.880	5
		The sense of competence, confidence and professionalism conveyed by the ambience in the lectures	0.706	0.784		
		The feelings that your best interests are being served	0.475	0.594		
		The university environment's ability to make you feel comfortable	0.450	0.590		
		Support Facilities				
5	6.299	The learning resources centre overall	0.615	0.540	0.778	3
		The IT facilities overall	0.602	0.544		
		The accommodation facilities/ services overall	0.477	0.495		
		The registration procedures	0.444	0.399		
		Explicit Service - Learning Delivery and Organisation				
6	5.625	The teaching ability of staff	0.670	0.719	0.840	7
		The subject expertise of the staff	0.627	0.677		
		The consistency of teaching quality irrespective of the lecturer	0.434	0.580		
		Explicit Service - Support Staff				
7	4.966	The helpfulness of administrative staff	0.668	0.686	0.828	8
		The helpfulness of technical staff	0.627	0.657		
		Implicit Service - Advice and Competence				
8	2.690	The availability of staff	0.593	0.771	0.838	6
		The competence of staff	0.481	0.665		

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Table 3 - Summary Statistics - Composite Factors

Performance				Importance			
Factor	Mean	Standard Deviation	Sample Size	Factor	Mean	Standard Deviation	Sample Size
1	3.31	0.866	823	1	4.13	0.844	823
2	3.54	0.845	823	2	4.41	0.766	823
3	3.05	0.912	823	3	4.30	0.808	823
4	3.46	0.927	823	4	4.22	0.835	823
5	3.34	0.923	823	5	4.23	0.815	823
6	3.29	0.863	823	6	4.32	0.791	823
7	3.36	0.851	823	7	4.18	0.804	823
8	3.18	0.899	823	8	4.15	0.806	823

Table 4 - Paired t-tests

Test	Means		Mean Differences	Standard Deviation	t	df	Sig (2-tailed)
	Performance	Importance					
F1 perf1 - imp1	3.31	4.13	-0.82	1.041	-22.583	822	0.000
F2 perf2 - imp2	3.54	4.41	-0.87	0.984	-25.361	822	0.000
F3 perf3 – imp5	3.05	4.23	-1.18	1.169	-28.964	822	0.000
F4 perf4 – imp3	3.46	4.30	-0.84	1.083	-22.246	822	0.000
F5 perf5 – imp4	3.34	4.22	-0.88	1.110	-22.734	822	0.000
F6 perf 6 -imp8	3.29	4.15	-0.86	1.125	-21.926	822	0.000
F7 perf 7 – imp6	3.36	4.32	-0.96	1.035	-26.615	822	0.000
F8 perf8 - imp7	3.18	4.18	-1.00	1.159	-24.746	822	0.000

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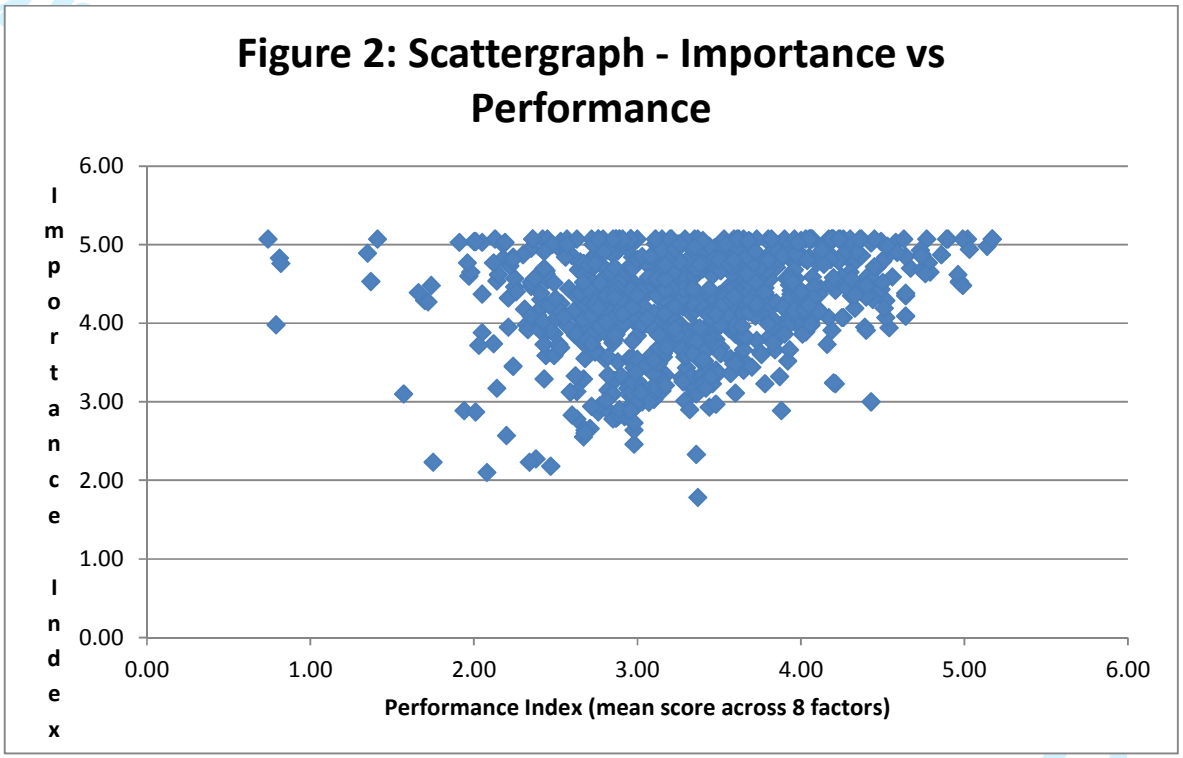
Q1: concentrate here	**Q2: keep up the good work**
Q3: low priority	**Q4: possible overkill**

Figure 1 – Quadrant Definitions (Martilla and James, 1977)



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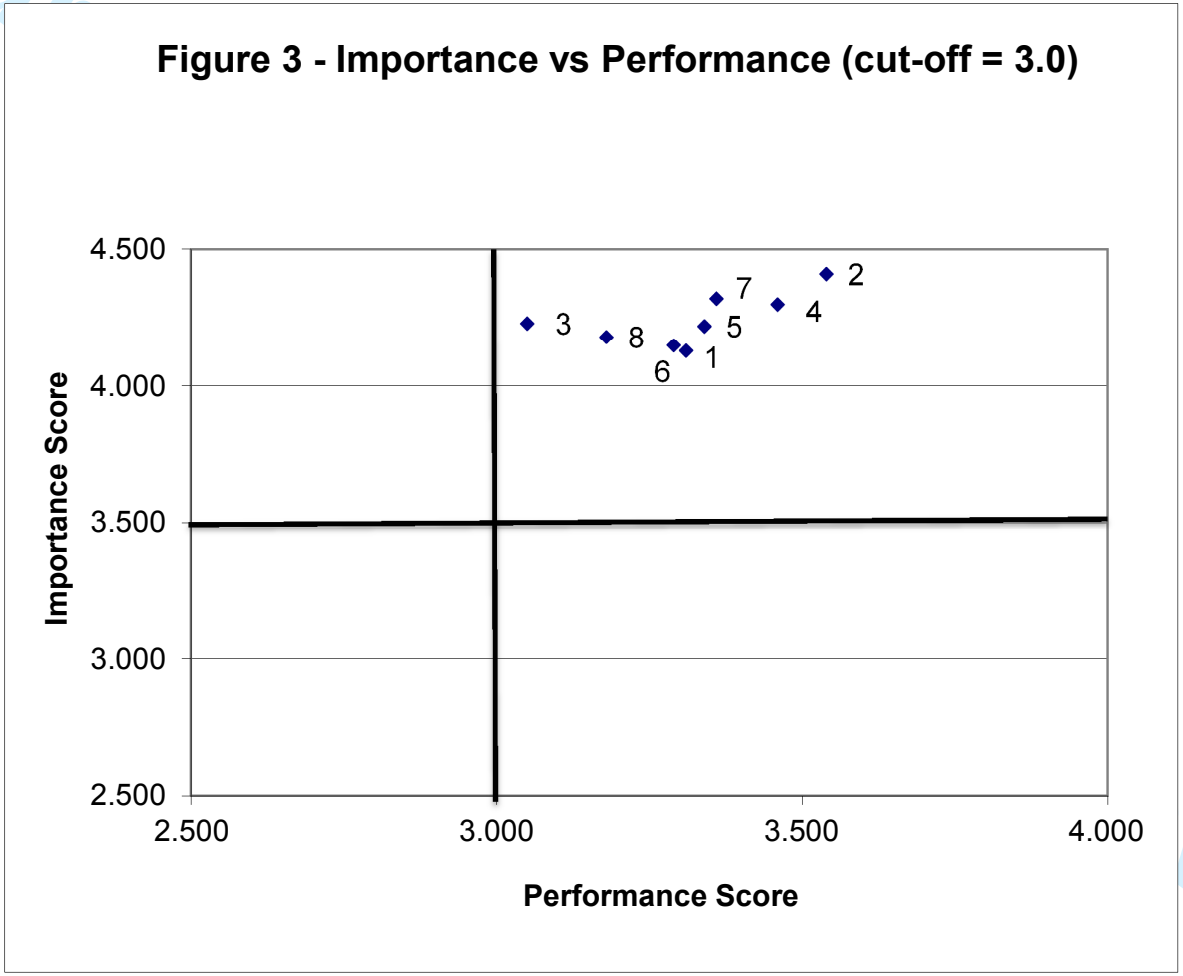
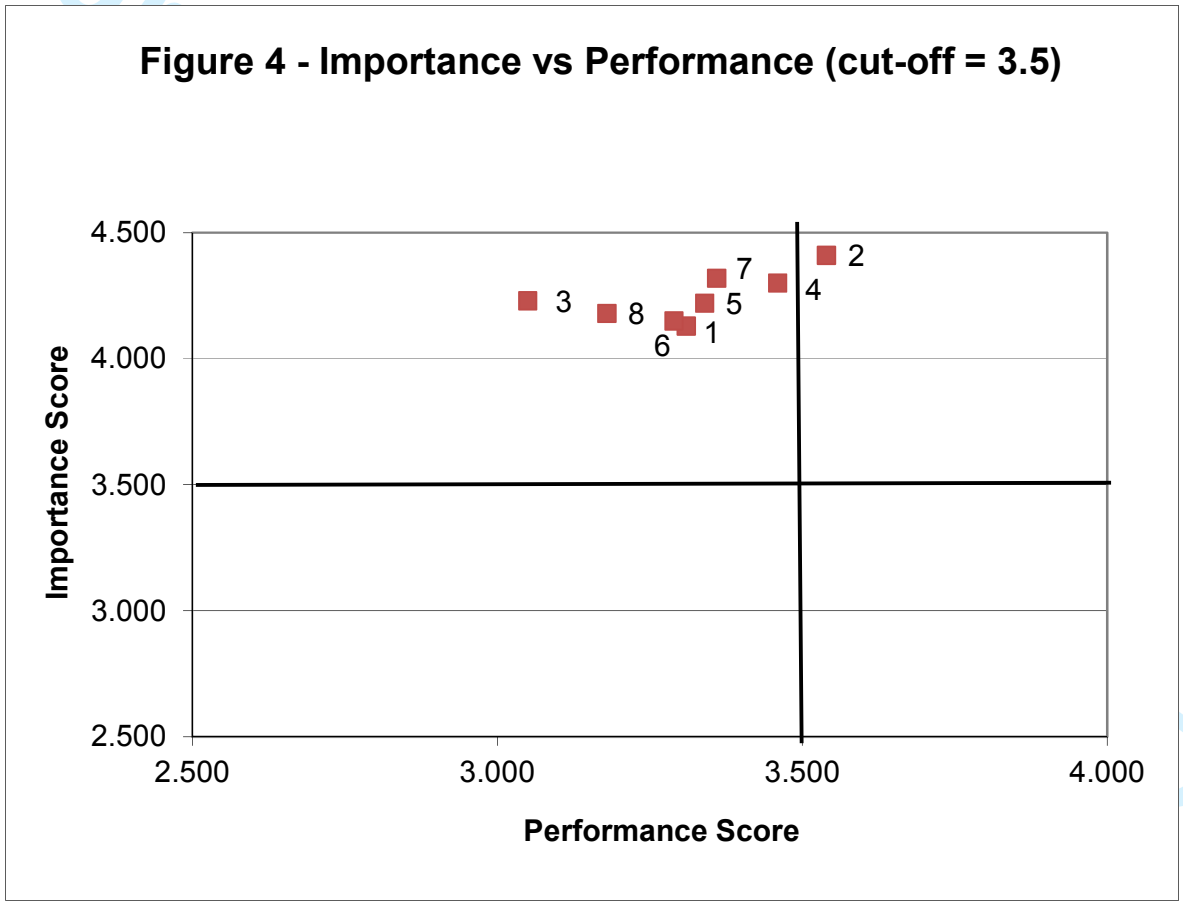


1.Explicit ***Service - learning, teaching, assessment and feedback; 2. Facilitating Goods - classes, materials and texts; 3. Implicit Service - Academic Support; 4. Implicit Service – University; 5 .Support Facilities; 6. Explicit Service - Learning Delivery and Organisation; 7. Explicit Service - Support Staff; 8. Implicit Service - Advice and Competence;***



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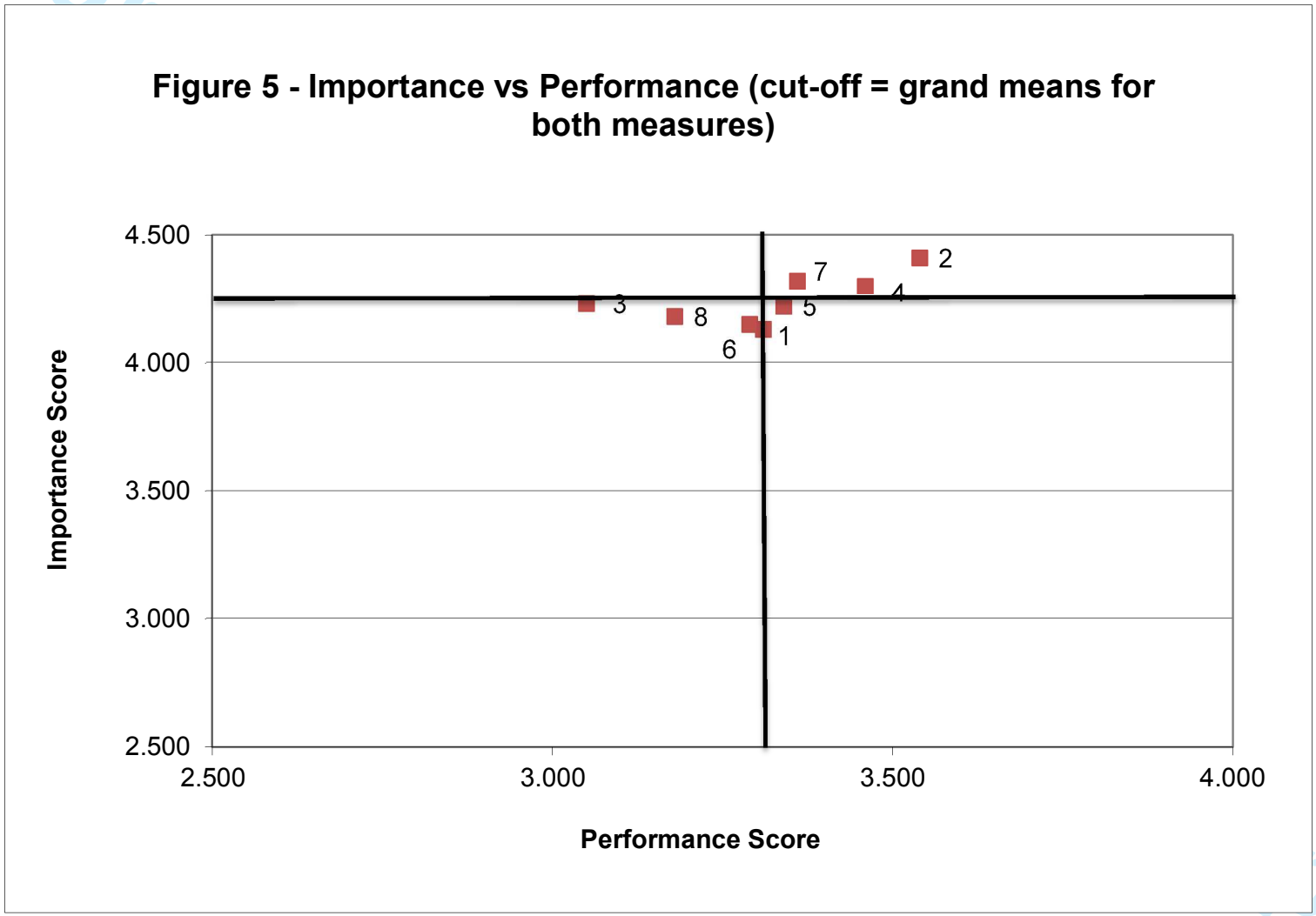

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